



2001

Drinkwater River Study

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Drinkwater River Presentation





Mr. Angell's Science Club

We are from Hanover, Mass. We are fifth grade students from Hanover Middle School. Our names are Rachel Keating, Katie Crimmins, Janine Gallagher, Greg Sands, Kristen Manning, Ganesh Chock, Derek Ullman, Samantha Stoddard, Chelsea Dube, and Krystal Purcell. Our science teacher is Mr. Angell. We are working on a project on the Drinkwater River. Our test sights are located in back of our school. We hope you enjoy our presentation!!!



OVERALL VIEW OF PROJECT

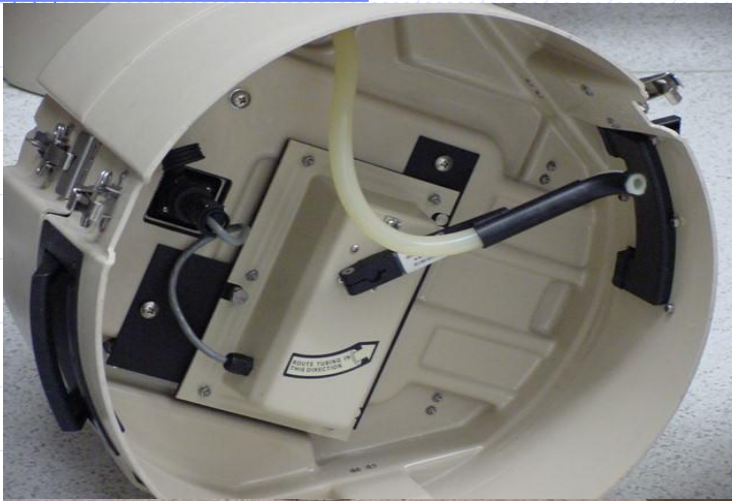
- ◆ Equipment
- ◆ Flow and profile
- ◆ Macroinvertebrates
- ◆ pH Testing
- ◆ Dissolved Oxygen
- ◆ Nutrients
- ◆ Temperature

Sigma 900

- ◆ AKA R2-D2
- ◆ Used to collect samples
- ◆ Programmed to sample every hour for twenty four hours
- ◆ Used one for each site



Sigma 900 (continued)



- ◆ Water was collected in white bottles hourly
- ◆ Water was distributed by rotating arm
- ◆ Hose and intake stretched to the middle of the stream

Watershed Access Lab

- ◆ Filtered frozen samples were brought here
- ◆ Lachat machine tested samples from R2-D2
- ◆ Tested for :Nitrate and Phosphorous



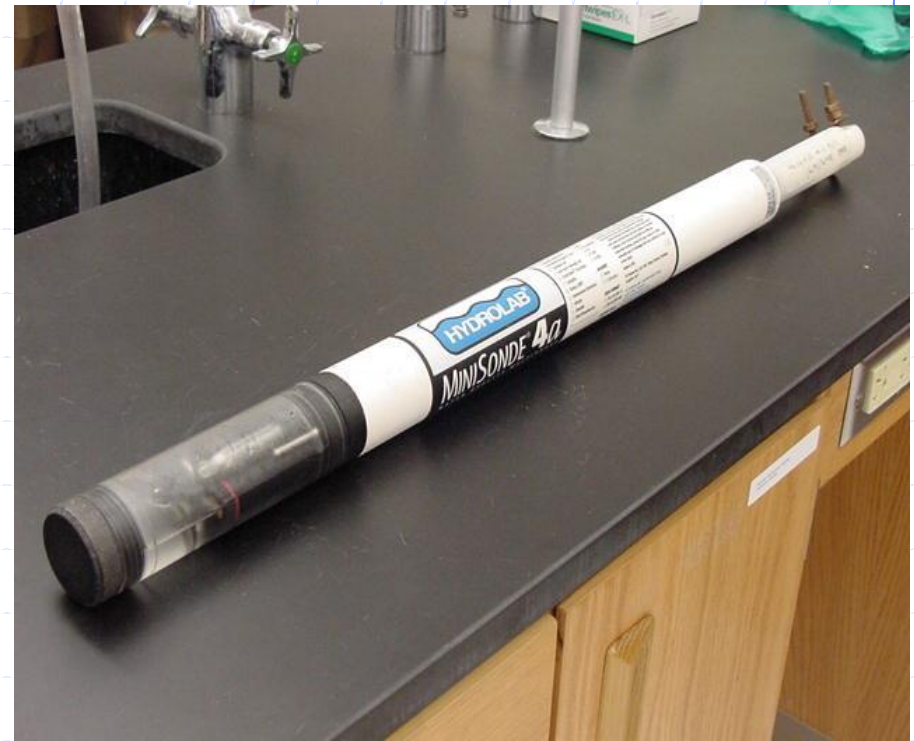
Marsh-McBirney Model 2000 Flo-Mate



- ◆ Used to measure the speed of the current at one foot intervals
- ◆ We measured from 6/10 from the top
- ◆ We made a spreadsheet in Microsoft Excel to calculate the total flow

Hydro Lab

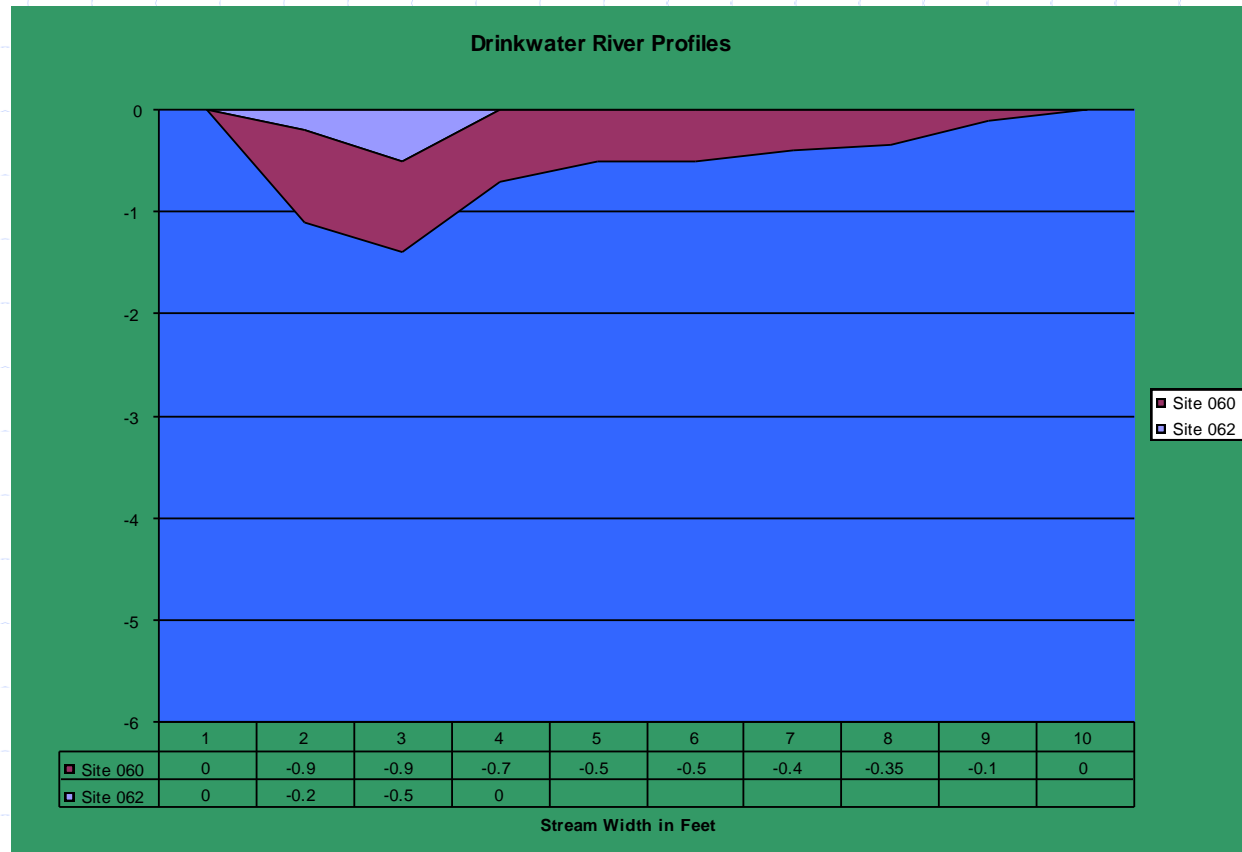
- ◆ Used to measure the pH, Temp., and Dissolved Oxygen (DO)
- ◆ It was chained to a float upside down
- ◆ It took readings every hour as the Sigma 900 did



The Flow & Profiles

Our findings were surprisingly different. Our sites are 1,000 feet apart but the total flow of downstream was 30 times greater than the total flow upstream.

The Cross Sections of the Two Stream Sites

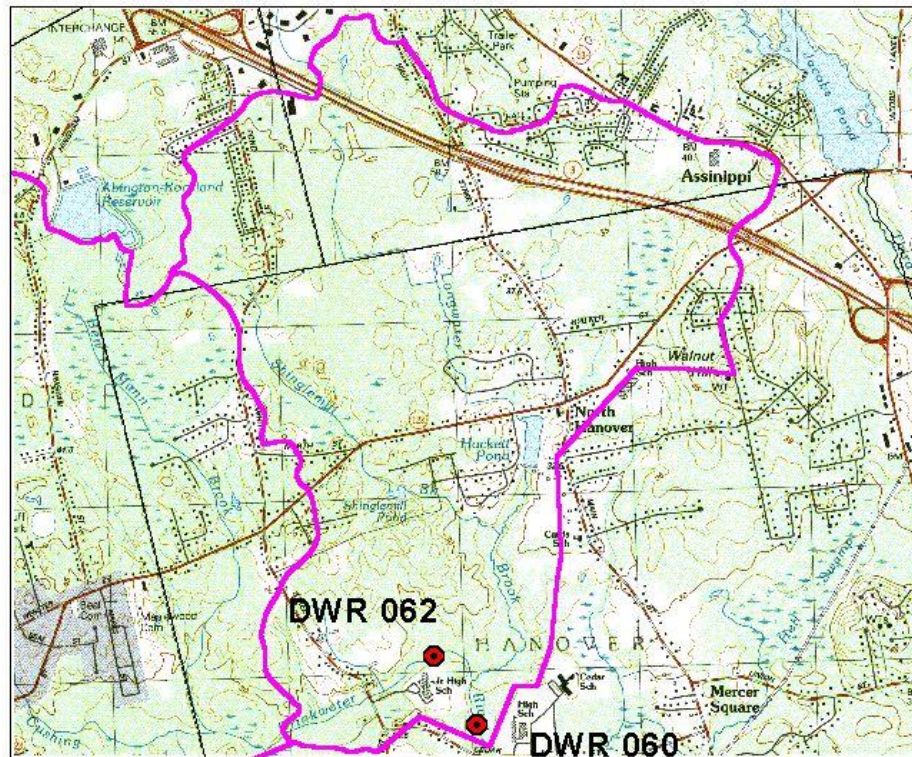


Information About the Total Flow (Q)

Drinkwater River sites 062, and 060 are only two tenths of a mile apart. However, the downstream site (060) had a flow 30 times greater.



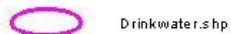
Drinkwater River Watershed



0.4 0 0.4 0.8 1.2 1.6 Miles



MassGIS Data Viewer



Drinkwater.shp



MA Towns

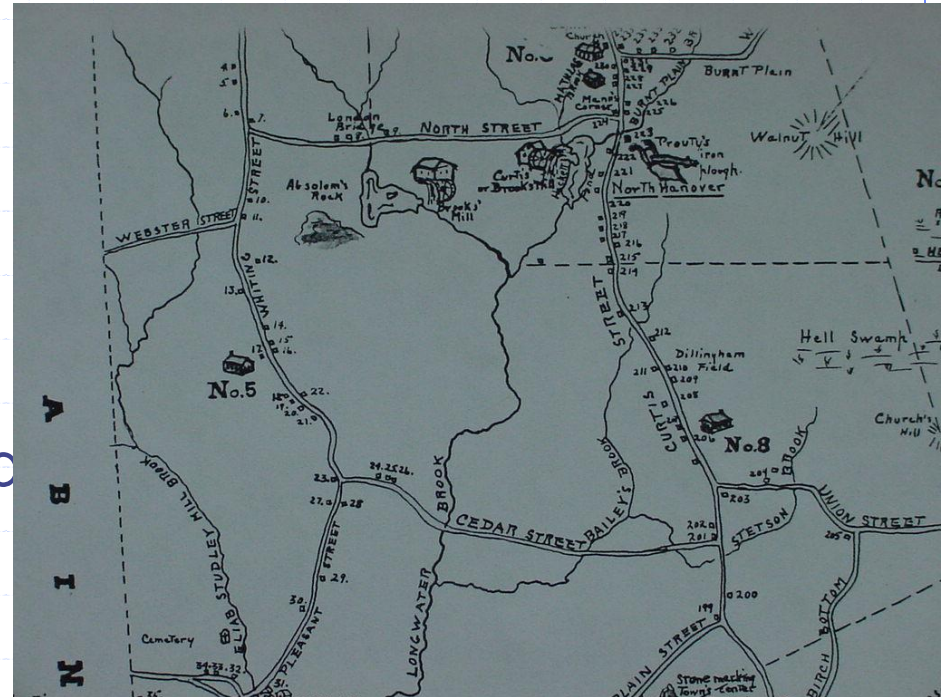
Drinkwater River Sites



- ◆ 1984 Topo Map (Weymouth Quad)
- ◆ Difference in flow is explained by tributary
- ◆ Drinkwater River's flow seems to change direction
- ◆ Deranged drainage pattern

Historic Map From 1860

- ◆ This is an old map of Hanover from 1860.
- ◆ The area where the Shinglemill Brook and Drinkwater River connect is missing.
- ◆ Our theory is that a farmer dried out his field by hand making a ditch after 1860.



Where Shinglemill and Drinkwater River join



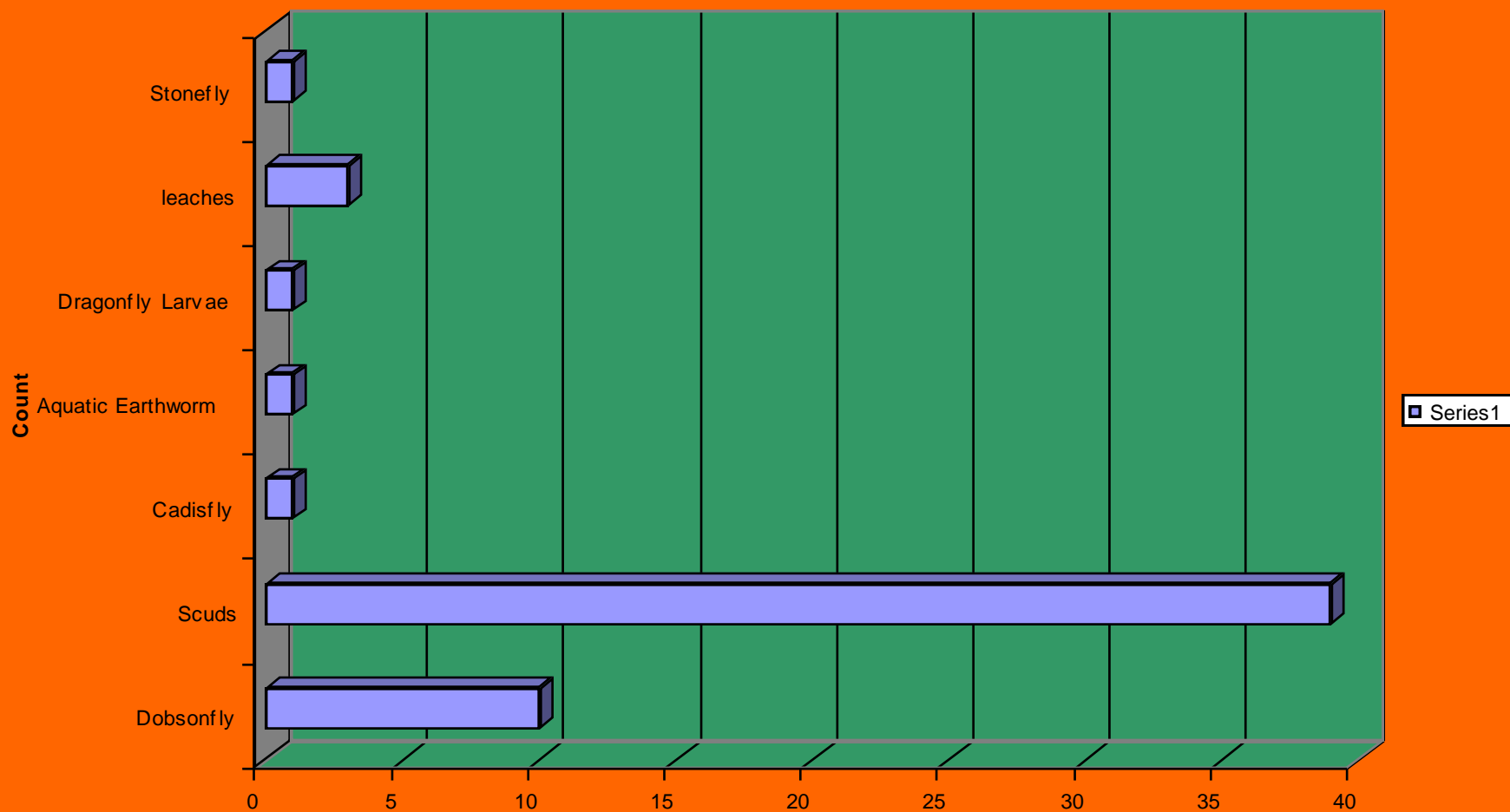
Gathering Macroinvertebrates



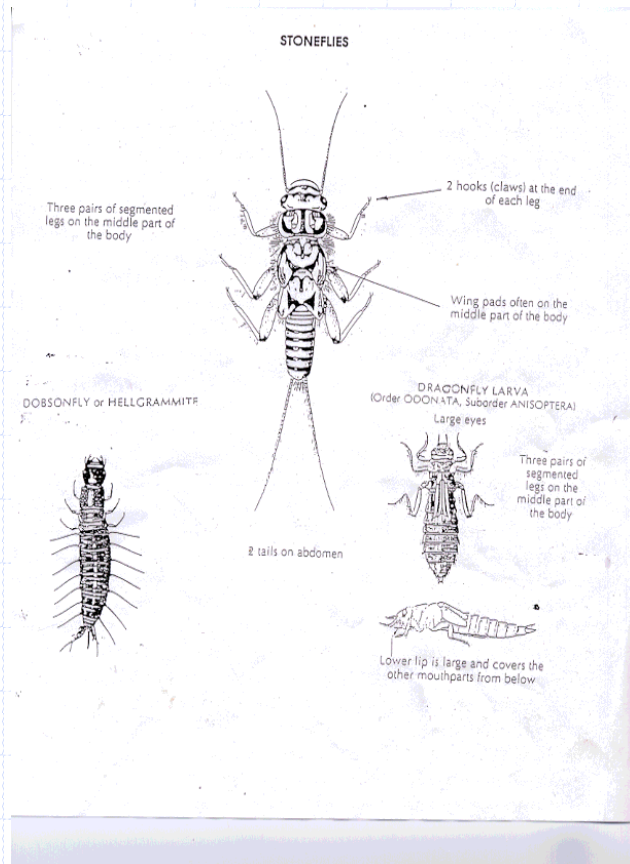
Observing Living Samples



Macroinvertebrate Population

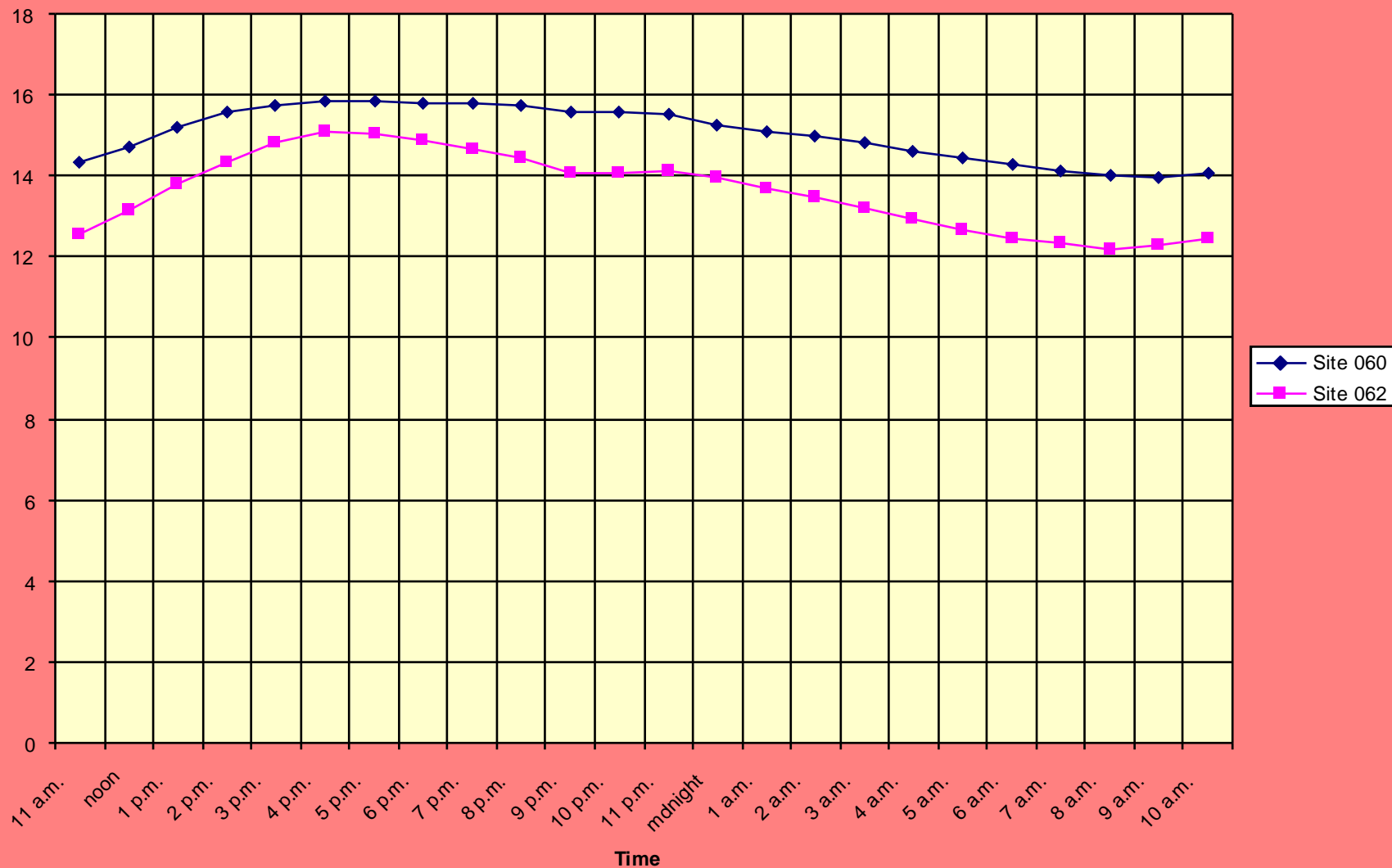


Macroinvertebrates in the Drinkwater River

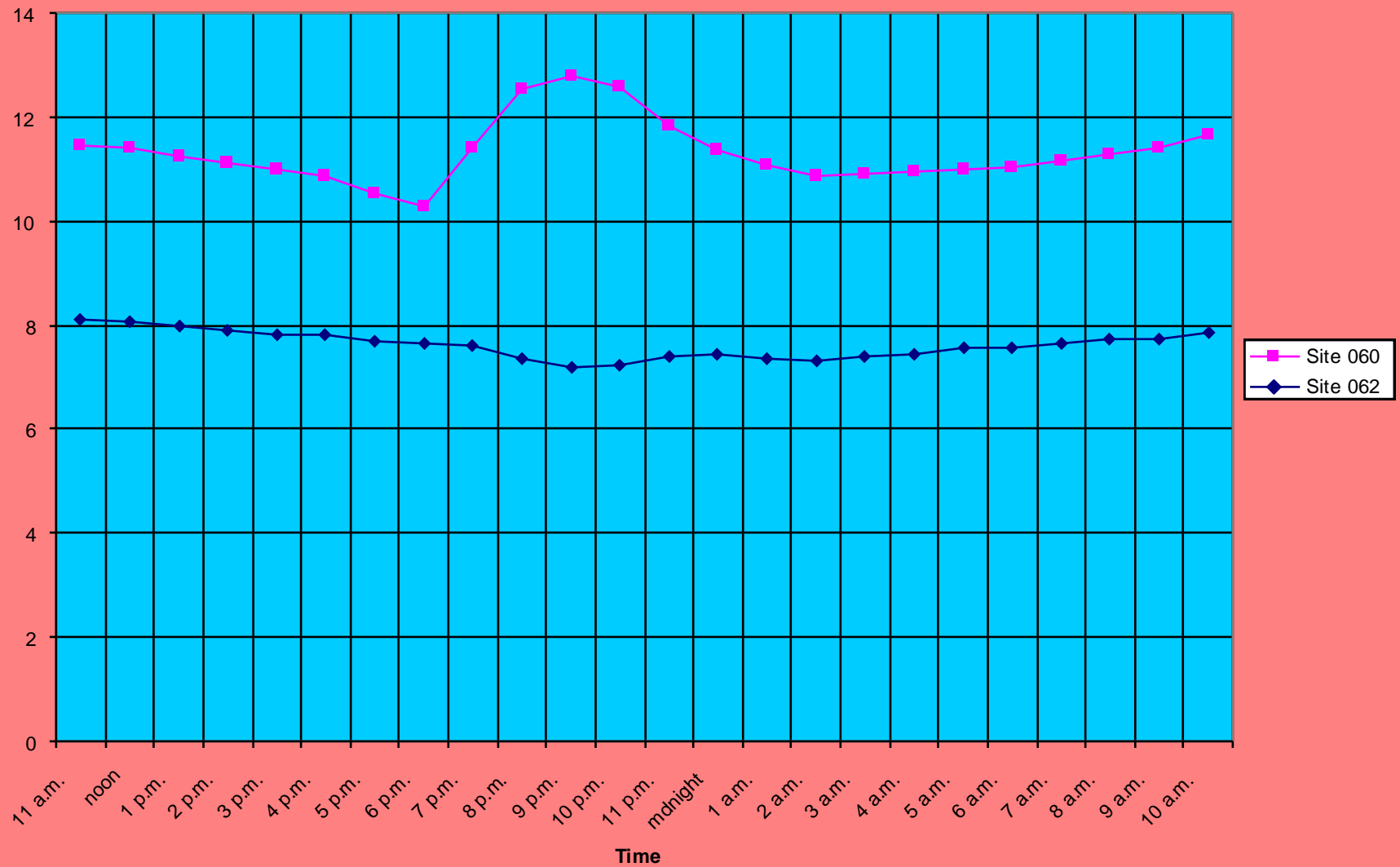


- ◆ Sampling at site 060 indicated a healthy stream
- ◆ We found no macroinvertebrates at site 062
- ◆ As you will see, many factors made it difficult for them to live at site 062

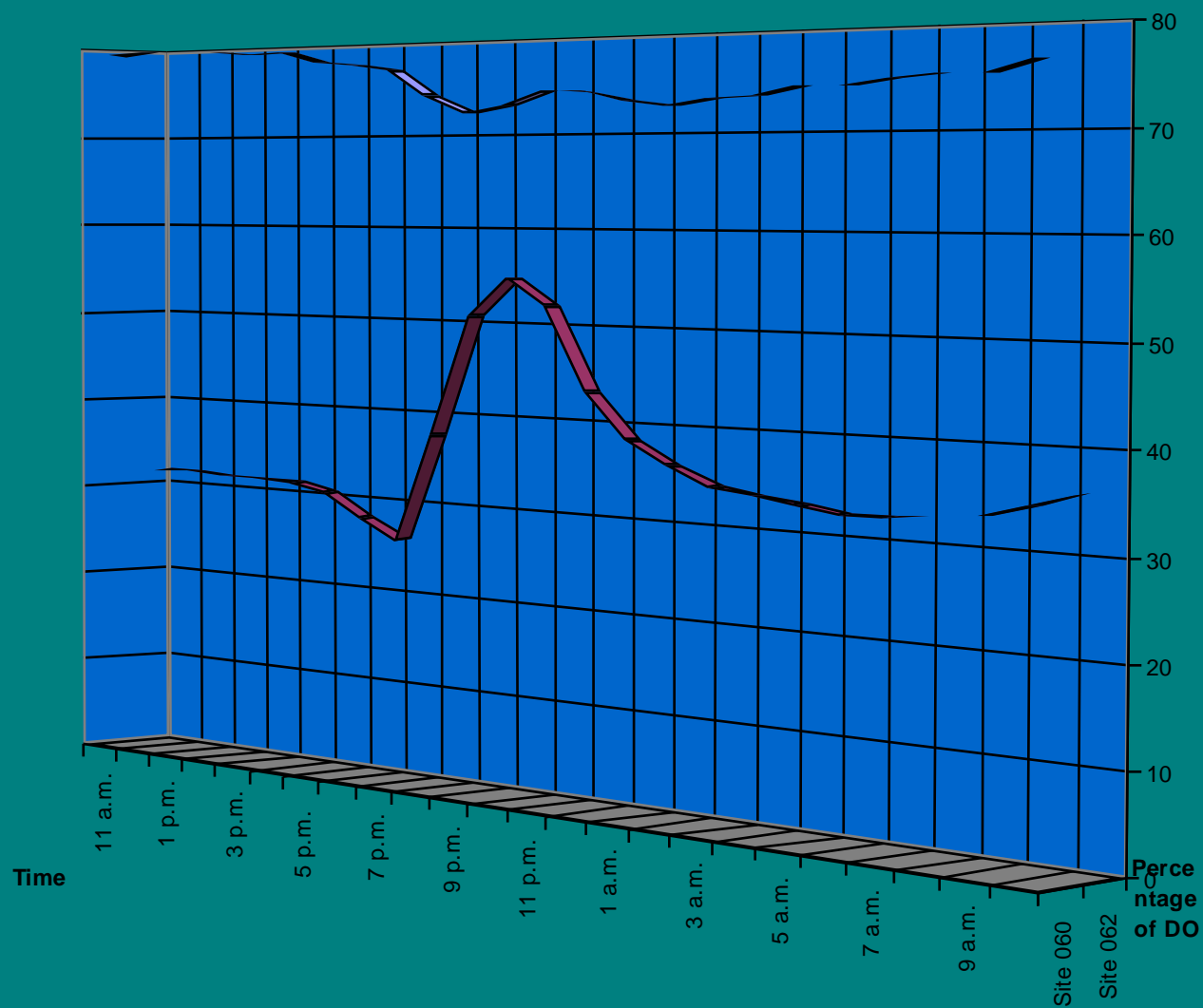
Temperature Comparison at Both Sites



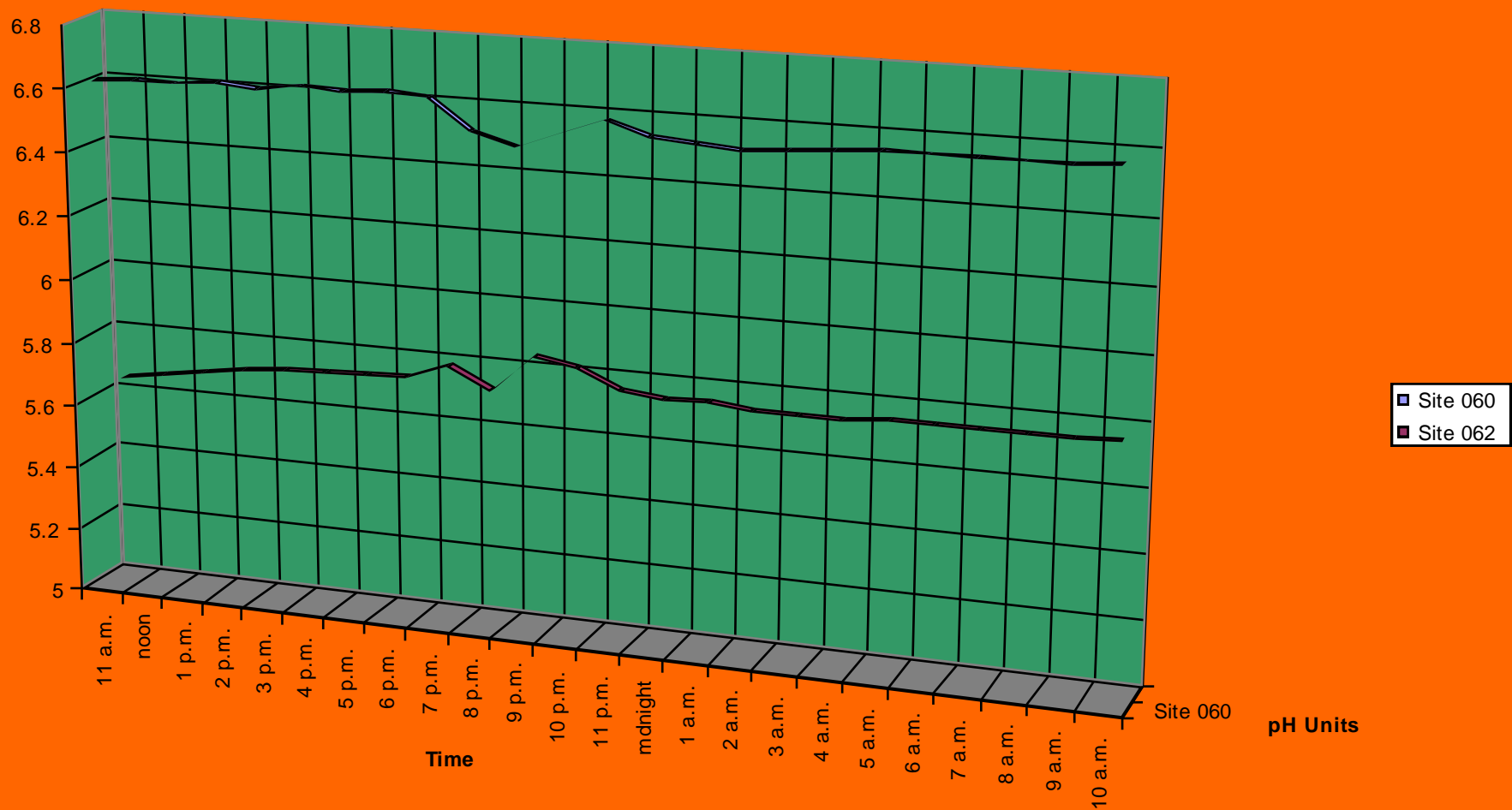
Dissovled Oxygen Camparison at Both Site



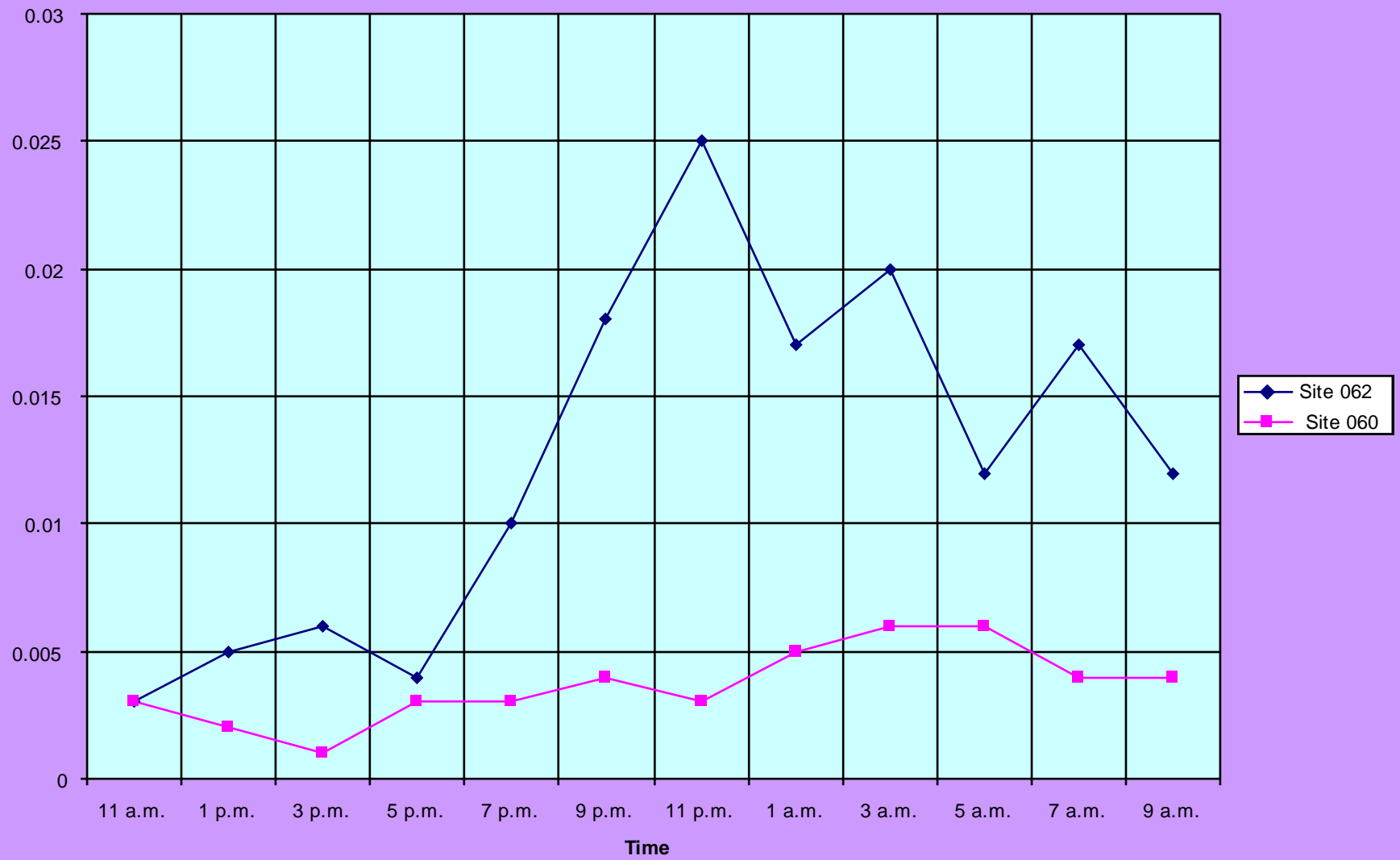
Saturation of Dissolved Oxygen at Both Sites



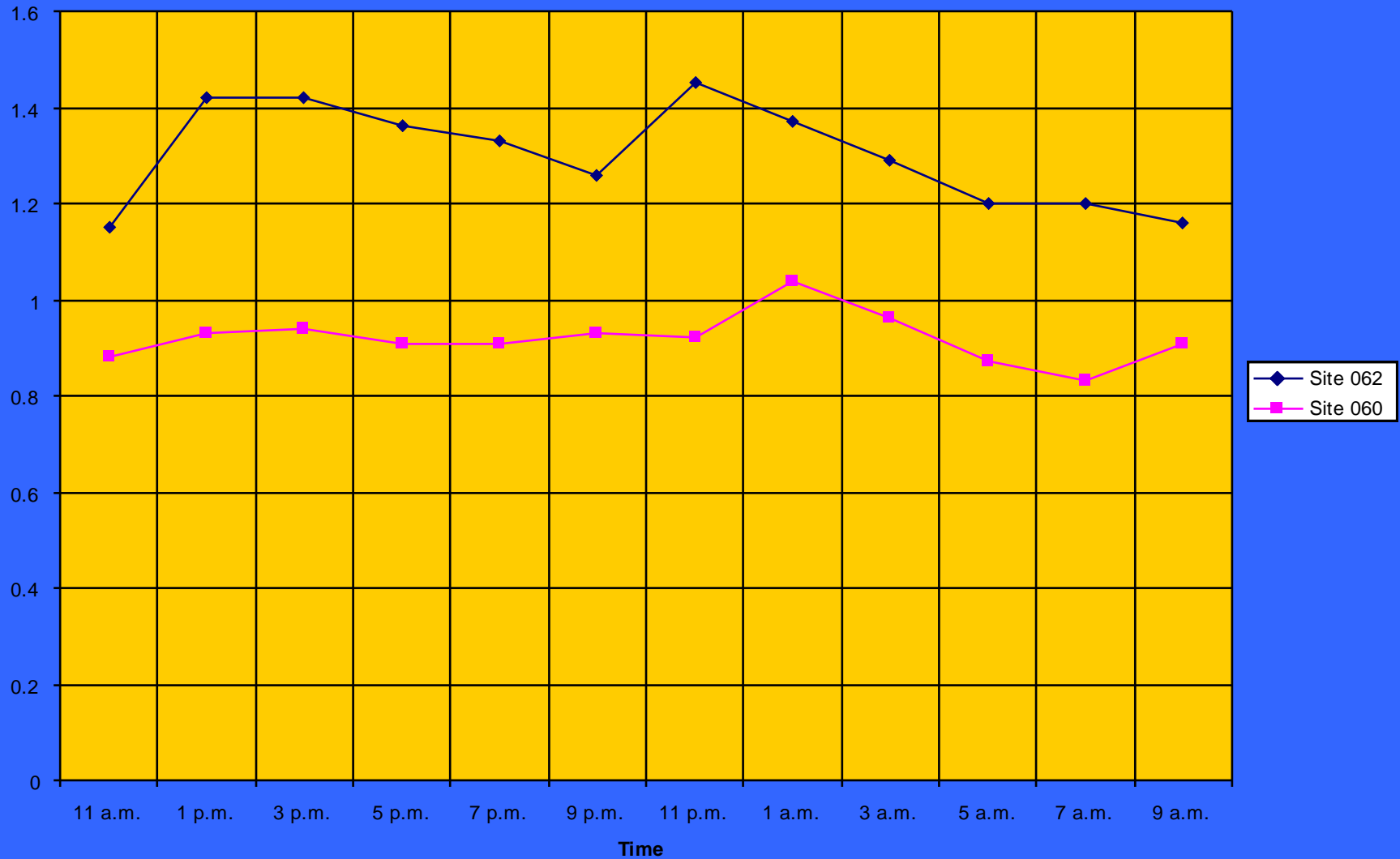
pH Comparison at Both Sites



Phosphate Comparisons at Both Sites



Nitrate Comparison at Both Sites



Changes in the Stream of Thought

